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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/667,384	09/23/2003	Dante Patrick Bonaquist	D-21372	1936
7590 06/06/2005			EXAMINER	
PRAXAIR, INC. LAW DEPT.- M1 557 39 OLD RIDGEBURY ROAD DANBURY, CT 06810			LEUNG, RICHARD L	
			ART UNIT	PAPER NUMBER
			3744	

DATE MAILED: 06/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

SP

Office Action Summary	Application No. 10/667,384	Applicant(s) BONAQUIST ET AL.	
	Examiner Richard L. Leung	Art Unit 3744	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 March 2005.
 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 5,7-9 and 11-13 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) ☐ Claim(s) _____ is/are allowed.
 6) ☐ Claim(s) 5,7,8,11 and 12 is/are rejected.
 7) ☒ Claim(s) 9 and 13 is/are objected to.
 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. Claims 5, 7, 8, 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5979440 (Honkonen et al.) in view of US 6442949 B1 (Laskaris et al.). Referring to Fig. 1, Honkonen et al. disclose a refrigeration system comprising a storage unit (dewar) having a storage space 14, a purge gas generator (oxygen concentrator) 11, a heat exchanger (recuperator) 15, a cryocooler 12 having a cold head (condenser) 13, means (lines) 50, 51 for passing gas from the purge gas generator 11 to the heat exchanger 15, means 57 for passing gas from the heat exchanger 15 to the cold head 13 of the cryocooler 12, means for passing fluid from the cold head 13 of the cryocooler 12 into the storage space 14, and means 52 for passing gas from within the storage space 14 to the heat exchanger 15. Honkonen et al. further disclose that purge gas generator 11 comprises an air compressor and an air cleaning system (column 7, lines 12-15), that cryocooler 12 is a pulse tube refrigerator comprising a pressure wave generator (pressure oscillator) 30 and pulse tube 34 containing working gas for receiving a pressure wave from the pressure wave generator 30 (column 11, lines 28-55; Fig. 12), and that the system further comprises means 25 for venting gas to the atmosphere communicating with the means passing gas from the heat exchanger 15. Honkonen et al. fail to disclose a gas contaminant cleaning system, particularly an ejector, means for passing gas from the purge gas generator 11 to the

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gas contaminant cleaning system, means for passing gas from the gas contaminant cleaning system to the heat exchanger 15, and means for passing gas from the heat exchanger to the gas contaminant cleaning system. Laskaris et al. teach a refrigeration system wherein a cooling fluid is passed to the cold head 56 of a cryocooler through a line 62 from a compressor 58 in order to cool the cooling fluid to cryogenic temperatures (column 5, lines 60-67). The cooling fluid is then passed through a passage 38 to cool a device 14. Laskaris et al. further teach the use of an ejector 90 that combines a portion of the used cooling fluid from a return line 66 from passage 38 with the stream of cooling fluid from the compressor 58 in line 62 to produce a combined stream that is subsequently passed to the cold head 56 of the cryocooler (column 8, lines 44-54; Figs. 4 and 5). It would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the system disclosed by Honkonen et al. to include an ejector to combine at least a portion of the vent gas from the heat exchanger 15 with the gas from the purge gas generator 11 (in line 51) because Laskaris et al. teach that the use of an ejector could reduce the size of the compressor that pressurizes the system (column 9, lines 54-56). This modification would have also allowed for the oxygen-rich vent gas exiting storage space 14 via line 52 to be recycled, which would have conceivably improved system efficiency since less gas from the purge gas generator 11 is required. By making such a modification, it should be understood that the combination would inherently contain means for passing gas from the purge gas generator 11 to the gas contaminant cleaning system (ejector), means for passing gas

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from the gas contaminant cleaning system to the heat exchanger 15, and means for passing gas from the heat exchanger 15 to the gas contaminant cleaning system.

Allowable Subject Matter

3. Claims 9 and 13 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

4. Applicant's arguments, see page 4 or Remarks, filed 31 March 2005, with respect to the rejections of claims 5-11 under 35 U.S.C 103(a) have been fully considered and are persuasive in view of the amendment to the claims. Therefore, the rejections have been withdrawn. However, upon further consideration, a new ground(s) of rejection (see above) is made in view of US 5979440 (Honkonen et al.).

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 3427817 (Rietdijk): discloses a refrigeration system comprising an ejector and a counter-flow heat exchanger.

US 3447339 (Rietdijk): discloses a refrigeration system comprising an ejector and a counter-flow heat exchanger.

US 3464230 (Rietdijk): discloses a refrigeration system comprising an ejector and a counter-flow heat exchanger.

US 5327729 (Yanai et al.): discloses a system for producing liquid nitrogen comprising a means for producing nitrogen-rich gas from the atmosphere, a cryocooler having a cold head, and a storage unit having a storage space.

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard L. Leung whose telephone number is 571-272-4811. The examiner can normally be reached on Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl J. Tyler can be reached on 571-272-4834. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Richard L. Leung
Examiner
Art Unit 3744


CHERYL TYLER
SUPERVISORY PATENT EXAMINER

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